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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NGUYEN, LEON VIET Q

ART UNIT	PAPER NUMBER
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2611

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,997	Applicant(s) LARSSON ET AL.	
	Examiner LEON-VIET Q. NGUYEN	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to communication filed on 10/13/09. Claims 16-22 have been added. Claims 1-22 are pending on this application.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 3 and 5 have been considered but are moot in view of the new ground(s) of rejection.

Response to Remarks

Regarding claim 1, applicant asserts that the office action fails to identify the communication parameters selected by the first set of user terminals in response to communication parameters for the second set of user terminals (Remarks page 16 last paragraph).

Examiner respectfully disagrees.

In the third paragraph on page 15 of the Remarks, applicant contends that Walton selects particular transmission rates and transmission modes for a particular user terminal. This is evident in claim 1. The examiner broadly interprets a physical layer communication parameter to be either the number of antennas associated with a transmission mode (¶0013 of Walton), a rate that is selected for a particular user terminal (claim 1 of Walton) or a number of spatial channels used for transmission (¶0358 of Walton), wherein the transmission mode or modulation scheme is interpreted

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to be a principle relied upon. Claim 1 fails to specifically define what physical layer communication parameters are.

Furthermore Walton teaches selecting a user terminal, transmission rate and transmission mode based upon feedback information sent from a user terminal (§§0217-§§0219 of Walton). One of ordinary skill in the art would find it obvious that user terminal 120y in fig. 7 be selected based on feedback information from user terminal 120x. Selecting the user terminal based on the feedback information is interpreted to be selecting a second set of user terminals in response to parameters of a first set of user terminals.

Further regarding claim 1, applicant requests that the examiner explain how the same diversity mode can be a second principle as well as a second physical layer communication parameter (Remarks page 17 second paragraph).

Assuming that a communication parameter is interpreted to be the number of spatial channels used for a particular transmission mode (see above), then diversity mode would be interpreted to be the second principle with one spatial channel as a communication parameter (§§0358 of Walton) and spatial multiplexing mode would be interpreted to be a first principle with multiple spatial channels as the first communication parameter (§§0358 of Walton).

The number of spatial channels corresponds to the number of transmit antennas and that spatial multiplexing mode can only be used within a multi-antenna user terminal (Table 2, 120y in fig. 7. Multiple transmit antennas) whereas diversity mode can

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be used within a single-antenna user terminal (Table 2, 120x in fig. 7. Single transmit antenna). The number of antennas corresponding to spatial channels is interpreted to be the different communication parameters (§0052 of Walton).

Regarding claim 3, applicant asserts that it would not have been obvious to combine the opportunistic MIMO method of Dong with the system of Walton (Remarks page 18 second paragraph).

Examiner respectfully disagrees.

In response to applicant's argument, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Also in response to applicant's argument that, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

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Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4, 6-9, 11, 13-15, 16, 17, 19, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al (US20040082356).

Re claim 1, Walton teaches a communication method for use in a communication network involving several user terminals (120x-120y in fig. 7) communicating with at least one transmitter node (110x in fig. 7), said transmitter node comprising a plurality of antennas (724a-724d in fig. 7), each of said user terminals comprising at least one antenna (752a-752d in fig. 7), said method comprising;

selecting a first set of user terminals comprising at least one user terminal (120y in fig. 7),

selecting a second set of user terminals not comprised in the first set (120x in fig. 7),

adapting first physical layer communication parameters for the first set of user terminals (¶0358, the multiple spatial channels for spatial multiplexing mode), according to a first principle suitable for optimizing communication with the first set of user terminals (¶0358, ¶0469, the user terminal performs singular value decomposition. It would be obvious to perform SVD on terminal 120x),

adapting second physical layer communication parameters, different from the first physical layer communications parameters (§0469, the single spatial channel for diversity mode), for the second set of user terminals (120y in fig. 7) according to a second principle, which is different from the first principle (§0553, it would be obvious that user terminal 120y perform in diversity mode), in response to the first physical layer communication parameters for the first set (§0217-§0219, see the response to Remarks above); and

transmitting to the first set of user terminals according to the first physical layer communication parameters and to the second set of user terminals according to the second physical layer communication parameters (§0217, each user terminal 120 receives downlink signals).

Although Walton does not explicitly teach that each set of user terminals has communication parameters adapted according to respective principles, Walton does teach that spatial multiplexing mode can only be used within a multi-antenna user terminal (Table 2, 120y in fig. 7) whereas diversity mode can be used within a single-antenna user terminal (Table 2, 120x in fig. 7). Each antenna is interpreted to correspond to a spatial channel (§0358) and the number of spatial channels is interpreted to be a communication parameter. One of ordinary skill in the art would have found it obvious to use a various number of antennas in each user terminal, effectively using different communication parameters for each terminal, based on cost considerations, safety issues and other factors (§0052).

Re claim 2, Walton teaches a method wherein the first principle involves optimization with respect to full or partial Channel State Information (§0299), for example by Singular Value Decomposition (§0469).

Re claim 4, Walton teaches a method wherein the first communication parameters (§0296) are related to the transmit power (§0296) and the beamforming matrix at the transmitter side (§0332).

Re claim 6, Walton teaches a method comprising the step of selecting the first set of user terminals in dependence of CSI knowledge (§0217).

Re claim 7, Walton teaches a method comprising the step of selecting the first set of user terminals (120x and 120y in fig. 7) in dependence of receiver antenna configuration (§0060, it would be obvious to select either the single or multi antenna user terminals).

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Re claim 8, the claimed limitations recited have been analyzed and rejected with respect to claim 1. It would be necessary to have an apparatus to perform the method as claimed in claim 1.

Re claim 9, the claimed limitations recited have been analyzed and rejected with respect to claim 2.

Re claim 11, the claimed limitations recited have been analyzed and rejected with respect to claim 4.

Re claim 13, the claimed limitations recited have been analyzed and rejected with respect to claim 6.

Re claim 14, the claimed limitations recited have been analyzed and rejected with respect to claim 7.

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Re claim 15, Walton teaches a MIMO based communication network involving several user terminals (120x-120y in fig. 7) communicating with at least one transmitter node, said transmitter node comprising a plurality of antennas (110x in fig. 7), each of said user terminals comprising at least one antenna (752a-752d in fig. 7, characterized in that said at least one transmitter node is a transmitter node according to claim 8 (724a-724d in fig. 7).

Re claim 16, the claimed limitations recited have been analyzed and rejected with respect to claim 1. It would be necessary to have an apparatus to perform the method as claimed in claim 1.

Re claim 17, the claimed limitations recited have been analyzed and rejected with respect to claim 2.

Re claim 19, the claimed limitations recited have been analyzed and rejected with respect to claim 4.

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Re claim 21, the claimed limitations recited have been analyzed and rejected with respect to claim 6.

Re claim 22, the claimed limitations recited have been analyzed and rejected with respect to claim 7.

3. Claims 3, 10, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al (US20040082356) in view of Dong et al (“Opportunistic transmission scheduling for multiuser MIMO systems” IEEE International Conference on Acoustics, Speech, and Signal Processing, 2003. Proceedings. (ICASSP '03), Publication Date: 6-10 April 2003, Volume: 5, On page(s): V-65-8).

Re claim 3, Walton fails to teach a method wherein the second principle makes use of opportunistic MIMO communication.

However Dong teaches utilizing a principle which makes use of opportunistic MIMO communication (page V-66 left side last paragraph, multi-user diversity).

Therefore taking the combined teachings of Walton and Dong as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the step of Dong into the method of Walton. The motivation to combine Dong and Walton would be to maximize total system capacity (page V-66 right side third paragraph of Dong).

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Re claim 10, the claimed limitations recited have been analyzed and rejected with respect to claim 3.

Re claim 18, the claimed limitations recited have been analyzed and rejected with respect to claim 3.

4. Claims 5, 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al (US20040082356) in view of Balachandran et al (US20040208183).

Re claim 5, Walton fails to teach a method comprising the step of selecting the first set of user terminals in dependence of traffic and quality of service parameters.

Balachandran teaches selecting user terminals in dependence of traffic and quality of service parameters (¶0056).

Therefore taking the combined teachings of Walton and Balachandran as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the step of Balachandran into the method of Walton. The motivation to combine Balachandran and Walton would be to maximize user satisfaction (¶0021).

Re claim 12, the claimed limitations recited have been analyzed and rejected with respect to claim 5.

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Re claim 20, the claimed limitations recited have been analyzed and rejected with respect to claim 5.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON-VIET Q. NGUYEN whose telephone number is (571)270-1185. The examiner can normally be reached on Monday-Friday, alternate Friday off, 7:30AM-5PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Q Nguyen/
Examiner, Art Unit 2611

/David C. Payne/
Supervisory Patent Examiner, Art Unit 2611